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Perceived Effects of Other People's Emotion Regulation on Their Vicarious Emotional Response

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Abstract

Across two studies, we investigated how friends' typically used emotion regulation strategies (rumination or reappraisal) influence judgements about their vicarious emotions (sympathy, tenderness, and personal distress) when presented with a photograph of a suffering toddler. Results of both studies demonstrated that participants reporting on a ruminative friend indicated that their friend would feel greater personal distress and less tenderness and would perceive the toddler as experiencing more need and pain than participants reporting on a reappraising friend. These results are consistent with the behavioural trajectories associated with rumination and reappraisal, and are discussed in light of their implications for interpersonal emotion regulation.

Keywords: vicarious emotions; regulatory strategies; reappraisal; rumination; social perception.

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Our social interactions and relationships with others are influenced by our perceptions of their emotions and emotion regulation abilities, including their empathic responses to the distress of third parties. Accurately inferring others' vicarious emotions facilitates appropriate and helpful responses to their concerns, demonstrating mutual understanding and increasing social bonding in relationships (Galinksy, Ku, & Wang, 2005). Being able to successfully decode others' emotions or being empathically accurate helps minimize conflicts and buffers against poor adjustment (Gleason, Jensen-Campbell, & Ickes, 2009; Simpson, Ickes, & Oriña, 2001). Although previous research has investigated emotion regulation and other people's emotional reactions, no studies to date have explored social perceptions of emotion regulation and others' vicarious emotions. The Emotions as Social Information model (EASI; Van Kleef, 2010) suggests that others' emotions are an importance source of information for observers about the targets' thoughts and feelings and about their behaviour towards the target. The EASI model suggests that observers make inferences relying on external signals (e.g., facial expressions); however, observers can also rely on other cues such as their inferences about others' emotion regulation tendencies. In the present studies, we investigated how perceived emotion regulation tendencies (rumination or reappraisal) influenced judgements about friends' vicarious emotions.

Vicarious Emotions

People experience *vicarious emotions* when something important to others is at stake (Wondra & Ellsworth, 2015). Imagine that your friend tells you that his/her child is extremely ill in hospital. According to the classical literature on vicarious emotions, your friend may experience empathic concern and/or personal distress (see Batson, 2011 for a review).

Empathic concern refers to other-oriented emotions elicited by and congruent with the perceived welfare of someone in need (Batson, 1991; Batson, Duncan, Ackerman, Buckley, & Birch, 1981). Conversely, personal distress refers to self-oriented negative emotions elicited by the distress of someone in need (Batson, 1991; Batson, Fultz, & Schoenrade, 1987).

More recently, a new distinction has been made suggesting that the emotional experience of empathic concern can be further divided into *tenderness* and *sympathy*, as they are linked to different appraisals (Lishner, Batson, & Huss, 2011; Niezink, Siero, Dijkstra, Buunk, & Barelds, 2012). Tenderness is evoked by the appraisal of chronic vulnerability; perceiving another person as vulnerable and helpless, and likely to be in need in the future. Sympathy, on the other hand, is evoked by the appraisal of current need, for instance, another person currently experiencing a deficit in wellbeing. These affective responses can be activated separately. However, in certain cases both affective responses can be activated by the same stimulus (e.g., observing a child or a puppy in need). It is important to separate both components when analysing empathic concern, as previous research has shown that each emotion is linked to different forms of prosocial behaviour. While tenderness is related to care (providing long-term assistance), sympathy is related to help (providing punctual and short-term assistance to fix a specific problem) (López-Pérez, Carrera, Oceja, Ambrona, & Stocks, 2016). Thus, going back to the previous example, our friend may experience sympathy as his/her child is in current need, tenderness as his/her child is vulnerable, and personal distress if our friend focuses on his/her own distress.

Emotion Regulation

An important factor determining the nature of someone's vicarious emotion is their use of emotion regulation (Gross, Richards, & John, 2006), that is, their attempts to modulate

their behavioural, experiential, or physiological emotional experience (Gross, 1998). For example, Eisenberg and collaborators (e.g., Eisenberg, Shea, Carlo, & Knight, 1991; Eisenberg, Michalik et al., 2007) have shown that lower control in regulating emotions is linked to higher personal distress, whereas higher control is linked to higher empathic concern. However, this research was based on a broad conceptualisation of emotion regulation that included a range of strategies without distinguishing those relating to empathic concern and personal distress.

More recent studies have looked at the effect of different regulation strategies on vicarious emotional responses. Initially, these studies mainly focused on *rumination*, which involves focusing repetitively on the experience of negative emotion and its causes and consequences (Lyubomirsky & Tkach, 2004; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Trapnell & Campbell, 1999; Watkins, 2008). Although individuals engage in rumination to better understand their feelings (Papageorgiou & Wells, 2003) and hold other positive metacognitive beliefs about the benefits of this regulation strategy (i.e., Papageorgiou & Wells, 2001), experimental studies have shown that rumination is related to anxiety and depression (e.g., Nolen-Hoeksema et al., 2008) and higher personal distress (Joireman, 2004; Joireman, Parrott, & Hammersla, 2002).

Other studies have focused on *reappraisal*, which is a strategy characterized by reframing emotional events to reduce their emotional impact (Gross, 2001). Studies have shown how reappraisal is linked to experiencing greater positive emotions and fewer negative emotions, without experiencing maladaptive physiological responses (Gross & John, 2003). Studies have shown that instructing people to use reappraisal may lower their personal distress (Ochsner & Gross, 2014). A recent study has looked at rumination and reappraisal in the same study showing that rumination led to higher personal distress, whereas reappraisal

led to higher empathic concern when both strategies were manipulated using experimental instructions and a priming procedure (López-Pérez & Ambrona, 2015).

Thus, according to the previous literature, it is probable that if our friend tends to use rumination, s/he may experience more personal distress, whereas if s/he uses reappraisal, it is more likely that s/he will experience empathic concern or its components (sympathy and tenderness).

Social Perception of Others' Emotions Depending on their Regulation Tendencies

We as observers not only make estimations or inferences about our friends' emotions but also about our friends' emotion regulation skills. In a study conducted by Loewenstein (2007), people made assumptions about the consequences of different emotion-regulation strategies for themselves and others, showing a preference for reappraisal over rumination, suppression, and distraction for both the observer and the target. Beyond preferences for certain emotion regulation strategies, the manner in which others regulate their emotions may also have an impact on the observer's inferences about the target. For instance, in a study by Lopes, Salovey, Côté, Beers, and Petty (2005) people with high emotion regulation skills were perceived by their peers more positively and to have more prosocial tendencies.

Therefore, people's appraisal of others' emotion regulation tendencies may impact their own perception of others' vicarious emotions. In line with Loewenstein's (2007) and Lopes et al.'s (2005) findings, if people perceive their friend as mainly using a maladaptive strategy such as rumination they may attribute more negative emotional responses and higher need and pain to that friend than if they perceive their friend as mainly using a more adaptive strategy such as reappraisal.

The Present Research

Studying observers' perceptions of other people's emotion regulation tendencies and its impact on how these observers construct a view of others' emotional (vicarious) response is increasingly relevant. As suggested by EASI model (Van Kleef, 2009), others' emotional expressions are an important source of information which shapes the observer's behaviour. Not being able to attune to others' emotional experiences can interfere with people's efforts to directly alter others' emotional reactions (i.e., interpersonal emotional regulation; Zaki & Williams, 2013). Inaccurate judgments of others' emotions may lead to misperceptions of others' feelings and needs as well as inappropriate emotional and behavioural responses (Lee, Zaki, Harvey, Oschner, & Green, 2011). Thus, studying further how an observer may interpret others' emotion regulation skills and vicarious emotional responses can help explain the observer's interactions with others, and facilitate prediction of whether the observer is more or less likely to initiate interpersonal emotion regulation (Wondra & Ellsworth, 2015).

The first objective of the studies reported here was to test whether previously reported effects of emotion regulation tendencies on vicarious emotional responses (i.e., rumination leading to higher personal distress and reappraisal leading to higher empathic concern) also apply to judgements about a friend's emotion regulation and vicarious emotions. More specifically, in Study 1 we assessed whether participants thinking about a friend who tends to use rumination as their main regulatory strategy (rumination condition) would report their friend as experiencing higher personal distress than participants thinking about a friend who tends to use reappraisal (reappraisal condition), as previously found for the target of the regulation process (López-Pérez & Ambrona, 2015). With regards to the two components of empathic concern, we did not pose any hypothesis as previous studies did not analyse them separately. In Study 2 a control condition was added to evaluate to what extent the obtained effects were due to the cost of rumination, the benefits of reappraisal, or both.

The second objective of these studies was to test the effects of social perception of rumination and reappraisal on the perception of need. We predicted that participants in the rumination condition would rate their friend's perception of the toddler's pain and need as higher, and would judge their friend as having more negative thoughts than participants in the reappraisal condition. We made this prediction because rumination unlike reappraisal involves focusing on the negative aspects of a situation and catastrophising (e.g., Martin & Dahlen, 2005). Furthermore, evidence relating to perceptions of the effects of emotion regulation suggests that strategies such as rumination are perceived as entailing more negative consequences (Loewentein, 2005). Hence, we expected that participants reporting on a friend who tends to ruminate may perceive their friend as experiencing a more negative emotional response and as perceiving higher need and pain in the toddler.

Study 1

Method

Participants. Sixty-four people (36 women, 28 men), aged between 18 and 31 years (M = 22.33 and SD = 3.47), agreed to participate in exchange for entering into a raffle for a £50 Amazon voucher (approximately $78). They were randomly assigned to either the Reappraisal condition or the Rumination condition.

Procedure. Participants were sent a link to complete a study on emotion regulation on Qualtrics (http://www.qualtrics.com/). After reading the introduction, participants gave informed consent. Then, participants received a set of instructions depending on the experimental condition explaining the nature of each emotion regulation strategy (López-Pérez & Ambrona, 2015). These instructions explained that rumination entails thinking repetitively about one's own thoughts and feelings, whereas reappraisal involves re-interpreting events. Next, participants in both conditions were asked to think of, and write

down the name of, a friend who consistently made use of the aforementioned regulation strategy in order to make judgements about that person in the study. Participants were asked to report on a same gender friend, as cross-sex friendships have distinct characteristics (e.g., Rose, Carlson, & Waller, 2007) and research has shown that friends are uniquely positioned to understand one another; they are 50 percent more accurate at inferring each others' thoughts and feelings compared to strangers (Stinson & Ickes, 1992).

Once participants had written down their friends' names, they were shown a picture of a toddler with a visible forehead injury (see Appendix A) for ten seconds. We selected this picture because it is capable of eliciting different vicarious emotions: tenderness (a child who is vulnerable), sympathy (a child who is in need), and personal distress (a child who has a physical injury). Then, participants completed the following measures about their friend's reaction toward the picture: a short version of the Empathic Response Questionnaire (Batson, Fultz, & Schoenrade, 1987); two items to assess perception of the victim's injury; four manipulation-check items; and one item to assess suspicion (i.e., whether participants had guessed the aim or hypotheses of the study). Six people were suspicious and were dropped from the analysis.

Measures.

Manipulation check items. To assess whether the experimental instructions worked as intended, participants were asked to report to what extent their friend would *take different perspectives* and *dwell on the negative aspects of the situation* while viewing the picture. Each item was answered on a 7-point scale (from 1 = not at all to 7 = extremely).

Empathic Response Questionnaire (ERQ, Batson et al., 1987). It was comprised of 9 emotional terms rated on a 7-point response format (from 1 = not at all to 7 = extremely). Scores were calculated by averaging participants' ratings of their friends' responses on three

separate 3-item subscales: situational sympathy (*moved, compassionate,* and *sympathetic*; Cronbach's alpha = 71), tenderness (*warmth, soft-hearted,* and *tenderness*; Cronbach's alpha = 77), and personal distress (*distressed, worried,* and *anxious;* Cronbach's alpha = 76).

Child's perceived need and pain. Participants rated two items regarding their friends' perceptions of the child (*How seriously in need of help was the child shown in the picture?* and *How much pain is the child feeling?*) on a scale ranging from 1 = not at all to 7 = extremely.

Friend's perceived thought valence. Participants completed two items about the emotional valence of their friend's thoughts (*Indicate to what extent your friend would have positive (negative) thoughts*) on a 7-point scale (from 1 = not at all to 7 = extremely).

Results

Male and female participants did not differ significantly on the key dependent variables so gender will not be discussed further. Please see Table 1 for descriptive statistics of all dependent variables. Independent samples t tests showed that participants in the rumination and reappraisal conditions did not differ significantly in how well they knew their friend, (Rumination M = 5.84, SD = 1.13; Reappraisal M = 6.19, SD = 0.93; $t(62) = -1.32$, $p = .19$, $d = .34$). The duration of acquaintanceship variable (years) was not normally distributed (Rumination M = 6.25, SD = 5.51, skewness of 1.55 and kurtosis of 1.96; Reappraisal (M = 6.97, SD = 7.33, skewness of 1.48 and kurtosis of 1.28), so we log-transformed the data. There were no significant differences between conditions, ($t(62) = -0.31$, $p = .97$, $d = .02$).

Manipulation check items. As intended, participants in the rumination condition reported that their friend would dwell significantly more on the negative aspects of the situation than participants in the reappraisal condition ($t(62) = 4.85$, $p = .001$, $d = 1.23$).

Participants in the reappraisal condition gave significantly higher ratings of their friend taking different perspectives than participants in the rumination condition ($t(62) = -3.37$, $p = .001$, $d = .86$).

Sympathy, tenderness, and personal distress. Independent samples t tests showed that participants in the rumination condition reported that their friend would experience significantly higher personal distress than did participants in the reappraisal condition ($t(62) = 2.52$, $p = .01$, $d = .54$). Furthermore, participants in the reappraisal condition reported that their friend would experience significantly higher tenderness than did participants in the rumination condition ($t(62) = 2.14$, $p = .04$, $d = .64$). There were no significant differences between conditions for sympathy ($t(62) = .59$, $p = .56$, $d = .15$).

Child's perceived need and pain. Participants in the rumination condition reported that their friend would perceive the victim as significantly more in need ($t(62) = 2.40$, $p = .02$, $d = .61$) and experiencing significantly more pain ($t(62) = 2.20$, $p = .03$, $d = .56$) than participants in the reappraisal condition.

Friend's perceived thought valence. As predicted, participants in the rumination condition reported that their friend would have significantly more negative thoughts than did participants in the reappraisal condition ($t(62) = 3.31$, $p = .01$, $d = .84$). Participants in the reappraisal condition reported that their friend would have significantly more positive thoughts than did participants in the rumination condition ($t(62) = 2.79$, $p = .01$, $d = .71$).

Discussion

The results of study 1 showed clear differences in participants' perceptions of the thoughts and feelings of friends who tended to use rumination and friends who tended to use reappraisal. As predicted, participants rated ruminating friends as experiencing higher personal distress and perceiving higher need and pain than reappraising friends. This result is

congruent with previously reported effects of rumination on personal distress (López-Pérez & Ambrona, 2015), and with evidence concerning lay theories about the effects of different regulation strategies, suggesting that rumination is perceived as entailing more negative consequences (Loewenstein, 2005).

Interestingly, participants also reported that a friend who tends to use reappraisal would experience higher tenderness, but not greater sympathy. One possible explanation is that reappraisal is seen as a way of focusing on the positive features of a situation (i.e., the toddler) and overlooking the negative ones (i.e., the injury). Thus, reappraisers may be perceived as experiencing pleasant feelings of warmth towards the child rather than empathic distress.

Study 2

In Study 1 we asked people to make judgements about a friend who would either ruminate or reappraise; however, we could not infer to what extent the obtained results were due to the cost of rumination, the benefits of reappraisal, or both. Therefore, in the present study we introduced a control condition where the friend was not selected as either a ruminator or reappraiser.

Method

Participants. One-hundred and seventy-one people (101 women, 70 men), aged between 18 and 72 years (M = 35.06 and SD = 11.75) participated in Study 2. They were assigned randomly to a reappraisal condition, a rumination condition, or a control condition. Participants were recruited from Amazon Mechanical Turk (MTurk) and received $0.50 for their participation. The reliability of MTurk participant samples has been validated elsewhere by comparisons with other samples and recruitment methods (Buhrmester, Kwang, & Gosling, 2011; Mason & Suri, 2012; Paolacci, Chandler, & Ipeirotis, 2010).

Procedure. The procedure and measures were identical to Study 1, except that participants in an additional control condition were asked to report about a friend they knew well without any specification of the type of emotion regulation strategy that friend tended to use.

Results

Male and female participants did not differ significantly on key dependent variables so gender will not be discussed further. A one-way between subjects analysis of variance found no significant differences between participants in the rumination (M = 6.19, SD = 1.13), reappraisal (M = 6.12, SD = 1.27), and control (M = 6.25, SD = .97) conditions in how well they knew their friend; (F (2, 168) = 0.17, p = .84, η^2 = .002). As the duration of acquaintanceship variable (years) was not normally distributed (skewness of 1.53, kurtosis of 2.43), we log-transformed the variable before conducting a similar analysis of variance. There were no significant differences between participants in the rumination (M = 0.96, SD = 0.39), reappraisal (M = 0.98, SD = 0.42), and control (M = 0.94, SD = 0.41) conditions (F (2, 168) = 0.14, p = .87, η^2 = .002). Please see Table 2 for the descriptive statistics of all the dependent variables.

Manipulation check items. There was a significant effect of experimental condition on the extent to which participants perceived their friends as dwelling on the negative aspects of the situation (F (2, 168) = 24.34, p = .001, η^2 = .86). Planned contrasts showed that participants in the rumination condition reported that their friend would dwell significantly more on the negative aspects of the situation than participants in the reappraisal and control conditions (t(168) = 6.90, p = .001), which did not differ significantly from each other (t(168) = 1.01, p = .31). There was also a significant effect of experimental condition on the extent to which participants perceived their friends as taking different perspectives on the situation (F

(2, 168) = 10.67, p = .001, η^2 = .84). Planned contrasts showed that participants in the reappraisal condition reported that their friend would take different perspectives significantly more than did participants in the rumination and control conditions (t(168) = 4.60, p = .01), which did not differ significantly from each other (t(168) = 0.48, p = .64).

Sympathy, tenderness, and personal distress. One-way between-subjects ANOVA revealed a significant effect of experimental condition on perceived personal distress (F (2, 168) = 11.30, p = .01, η^2 = .99) and tenderness (F (2, 168) = 9.93, p = .001, η^2 = .98), but not on sympathy (F (2, 168) = 0.47, p = .63, η^2 = .13). Planned contrasts revealed that participants in the rumination condition reported that their friend would experience significantly higher personal distress than did participants in the reappraisal and control conditions (t(168) = 4.46, p = .001), which did not differ significantly from each other (t(168) = 1.65, p = .10). Planned contrasts also showed that participants in the reappraisal condition reported that their friend would experience significantly higher tenderness than did participants in the rumination and control conditions (t(168) = 3.93, p = .01), and participants in the control condition reported that their friend would experience significantly higher tenderness than did participants in the rumination condition (t(168) = 2.10, p = .04).

Child's perceived need and pain. There was a significant effect of experimental condition on perceptions of the child's need (F (2, 168) = 20.26, p = .001, η^2 = .99). Planned contrasts revealed that participants in the rumination reported that their friend would perceive significantly higher need than did participants in the reappraisal and control conditions (t(168) = 3.98, p = .001), and participants in the control condition reported that their friend would perceive significantly higher need than did participants in the control condition (t(168) = 4.97, p = .001) .

There was also a significant effect of experimental condition on the level of pain that participants reported their friend would attribute to the child (F (2, 168) = 5.92, p = .003, η^2 = .87). Planned contrasts revealed that participants in the rumination condition reported that their friend would perceive significantly higher pain than did participants in the reappraisal and control conditions (t(168) = 3.33, p = .001), who did not significantly differ from each other (t(168) = 0.88, p = .38) .

Friend's perceived thought valence. As predicted, experimental condition had a significant effect on participants perceptions of their friend's level of negative thoughts about child's injury (F (2, 168) = 11.10, p = .001, η^2 = .81). Planned contrasts showed that participants in the rumination condition reported that their friend would have significantly more negative thoughts than did participants in the reappraisal and control conditions (t(168) = 4.10, p = .001), and participants in the control condition reported that their friend would have significantly more negative thoughts than participants in the reappraisal condition (t(168) = 2.33, p = .02). Experimental condition had a corresponding significant effect on levels of positive thoughts (F (2, 168) = 11.56, p = .001, η^2 = .79). Planned contrasts revealed that participants in the reappraisal condition reported that their friend would have significantly more positive thoughts than did participants in the rumination and control conditions (t(168) = 4.26, p = .001), who did not differ significantly from each other (t(168) = 1.98, p = .06) .

Discussion

The findings of Study 2 were broadly consistent with those of Study 1. Again, participants reported that a ruminating friend would experience higher personal distress and perceive higher need and pain in the child. Conversely, participants reported that a ruminating friend would experience higher tenderness. There were significant differences in perceptions of need and tenderness between the control condition and both reappraisal and

rumination conditions, showing that both strategies are perceived as influencing these outcomes. However, perceptions of the friend's personal distress and attribution of pain to the child did not differ significantly across reappraisal and control conditions, and were only significantly affected by the rumination condition. This pattern of results is consistent with the conclusion that rumination is more associated with distress and pain whereas reappraisal is associated with alleviating distress or moderating appraisals of pain. Previous research supports a link between rumination and catastrophizing (Garnefski, Koopman, Kraaij, & ten Cate, 2009), but further research is needed to determine whether reappraisal can influence perceptions of distress and pain in other contexts, and if not, why not. Overall, these results confirm and give further support to previous research on people's lay theories about different regulation strategies (Loewenstein, 2005).

General Discussion

People as observers make inferences about others' emotions. Although sometimes observers may rely on external signals such as facial expressions (EASI, Van Kleef, 2009), people can also make judgements based on their own lay theories about emotion regulation. In the present research we explored whether people's beliefs about their friends' emotion regulatory tendencies impacts judgments about their friend's vicarious emotions. Given that previous research has found that different regulation tendencies affect vicarious emotions, we aimed to test whether people's different emotion regulation strategies are perceived to affect vicarious emotions.

Overall the findings of the two studies were consistent. In Studies 1 and 2, participants in the rumination condition reported that their friend would experience higher personal distress compared to participants in the reappraisal condition. This result is consistent with previous literature focused on the agent of the regulatory process, as people

who either scored higher in rumination (Joireman et al., 2002) or were under rumination instructions or priming (López-Pérez & Ambrona, 2015) reported higher personal distress. As for the components of empathic concern, only tenderness demonstrated an effect; participants who reported about a friend who tended to use reappraisal strategies reported that their friend would feel higher tenderness compared to those who reported about a friend who tended to ruminate. Reappraisal is therefore linked to higher tenderness yet sympathy was not associated with either strategy. This result further supports the distinction between the different components of empathic concern as suggested by Lishner et al. (2011). Reappraisal involves reframing a negative event to reduce its emotional impact and therefore puts higher emphasis on the positive aspects of a situation (Levine, Schmidt, Kang, & Tinti, 2012).

It is possible that the use of reappraisal as a regulation strategy may trigger a more positive appraisal of the situation through a focus on the positive features of the situation. This seems to be supported in Studies 1 and 2, as participants who reported on a friend who tends to use reappraisal indicated that they had more positive thoughts. Our results also showed the expected pattern for others' assessment of need demonstrating that emotion regulation affects the appraisal of a situation (Gross, 2007). Participants in the rumination condition reported that their friend would perceive the toddler as higher in need and in more pain, and would have more negative thoughts than participants in the reappraisal condition. These results are consistent with previous literature that has linked rumination to focusing on the negative aspects of a situation and with more catastrophizing (Garnefski et al., 2009). These results suggest that regulatory style influences both the observers' recognition of their friends' emotional response and their appraisal of the situation. This is consistent with previous literature which has shown how social perceptions of others' emotional experiences may lead to inferences about other different domains such as people's character (e.g., Hareli

& Hess, 2010). Further, findings from Study 2 suggest that the effects are driven by both rumination and reappraisal. Thus, it seems that rumination is associated with more negative perception of others' emotions and cognitions whereas reappraisal is associated with more positive perceptions.

Although the present research is a first step in the study of the perception of others' emotion regulation strategies and their vicarious emotions, there are some limitations. First, we relied on participants' personal judgements about whether their friend tended to ruminate or reappraise. Furthermore, these friends may have differed on other dimensions that could have contributed to the effects. Hence, future research should investigate whether people's perceptions and inferences actually match with others' regulation tendencies and actual vicarious emotional responses. Additionally, we tested the effect using a stimulus which could elicit different vicarious emotional responses (tenderness, sympathy, and personal distress) at the same time. Future research can investigate the effect of emotion regulation strategies on vicarious emotional responses by manipulating the type of need (e.g., physical vs. psychological). We would expect a greater effect of the emotion regulation strategy on the emotional response for physical pain and a vulnerable victim because as Eisenberg et al. (2003) have suggested, emotion regulation may impact the vicarious response when the situation is highly arousing which physical pain and perception of greater vulnerability of the target may achieve at a lower threshold.

Overall, the present findings showed that people make inferences about others' regulatory styles. This supports previous findings which demonstrated that people made capable estimations of others' emotion regulation skills and efficacy (Lopes et al., 2005; Loewenstein, 2007). Furthermore, our results add to the literature on social perception of others' emotional responses by showing that people not only make estimations about others'

personal emotional reactions (e.g., Fischer & Manstead, 2008) but also about others' vicarious emotional reactions. Accordingly, perceptions about others' emotion regulation skills may shape the way people interact and regulate others' emotions. It is therefore possible that people adjust their behaviour depending on their perception of other's emotion regulation skills and preferential use of adaptive or maladaptive regulation strategies. Future research can investigate if others' regulatory styles impact how people help others change their emotional states (Zaki & Williams, 2013). According to our results, we would expect that if observers believe that others regulate their own emotions inflexibly and rely on maladaptive strategies these observers will be more likely to engage in interpersonal emotion regulation. Although previous literature has tried to integrate findings on emotion regulation and vicarious emotions to explain interpersonal emotion regulation (Zaki & Williams, 2013), our studies contribute to the sparse literature in this domain by taking into account people's meta-cognitions about the effects of emotion regulation strategies on vicarious emotional responses.

Compliance with Ethical Standards

The authors declare that they do not have any conflict of interests. The research conducted has obtained ethical approval from the authors' institution and was conducted in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. It was carried forth after obtaining informed consent from all participants.

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Table 1

Descriptive Statistics for Measures in Study 1

	Personal distress	Sympathy	Tenderness	Perception of need	Perception of pain	Have negative thoughts	Have positive thoughts	Take different perspectives	Dwell on the negative aspects of the situation
Rumination condition	4.01 (1.26)	4.84 (1.22)	3.77 (1.47)	5.63 (0.91)	4.72 (1.42)	4.78 (1.31)	2.47 (1.34)	3.09 (1.53)	4.43 (1.59)
Reappraisal condition	3.31 (0.92)	5.01 (1.03)	4.49 (1.20)	5 (1.16)	3.91 (1.53)	3.63 (1.48)	3.47 (1.52)	4.31 (1.36)	2.78 (1.29)

Note: Standard deviations are noted in parentheses.

Table 2

Descriptive Statistics for Measures in Study 2

	Personal distress	Sympathy	Tenderness	Perception of need	Perception of pain	Have negative thoughts	Have positive thoughts	Take different perspectives	Dwell on the negative aspects of the situation
Rumination condition	5.07 (1.22)	5.28 (1.24)	4.22 (1.54)	6.05 (1.08)	6.25 (.76)	5.40 (1.16)	2.55 (1.13)	3.77 (1.41)	5.91 (1.15)
Reappraisal condition	3.91 (1.39)	5.04 (1.30)	5.41 (1.19)	4.65 (1.25)	5.65 (1.01)	4.09 (1.80)	3.79 (1.72)	5.02 (1.60)	4.00 (1.83)
Control condition	4.32 (1.37)	5.18 (1.43)	4.78 (1.53)	5.82 (1.44)	5.81 (1.08)	4.74 (1.45)	2.67 (1.41)	3.91 (1.71)	4.30 (1.66)

Note: Standard deviations are noted in parentheses.

Appendix A. *Picture used in the studies*